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SUBJECT: INTEGRATING RUSSIAN SCIENCE AND EDUCATION KEY TO INNOVATION
AND SKILLED NANOTECHNOLOGY WORKFORCE

REF: A) Moscow 2782 B) Moscow 0333

MOSCOW 00002885 001.2 OF 003

Sensitive but Unclassified, Not for Internet Distribution

1. (SBU) Summary: At an October 8 panel during the Second International NanoForum, Russian policy makers, scientists, educators and entrepreneurs discussed how to develop Russia's high technology economy and its nanotechnology workforce. President Medvedev told Forum participants on October 6 that Russia needs 100,000-150,000 trained nanotechnology specialists to become a global nanotechnology leader, instructing the Ministry of Education and Science to make producing them one of its top priorities. Panelists proposed bringing PhD scientists back into high schools and universities to improve the quality of science education and to motivate students to pursue science careers and called for additional university-based nanotechnology educational and research centers. They agreed that Russia will not be able to develop its nano-industry unless it adopts a more interdisciplinary approach to nano education, improves interaction between science and business, and expands inter-university and inter-institutional cooperation within Russia and with foreign universities and research centers.
END SUMMARY

Academicians -- Go Back to School!

2. (U) On October 8, the third and final day of the Russian Corporation for Nanotechnologies (Rusnano) Second International Nano Forum, Alexander Khlunov, Deputy Minister of the Russian Ministry of Education and Science (MES), chaired a well-attended "Science and

Education" panel discussion. In his opening remarks, he stressed the importance of improving the quality of high tech education in Russia. He noted that Russian cosmonaut Yuriy Gagarin's successful flight resulted in a greater emphasis on math and science education in U.S. secondary schools, an investment that proved quite effective for the United States. Khlunov stated that the overall trend in Russia over the last decade has been a reduction in the quality of high school science teachers. Another presenter pointed out that the number of specialized science courses offered at gymnasiums, lyceums and secondary schools has actually risen, perhaps to compensate for lower quality teaching standards. To improve science education, Khlunov and rectors and vice-rectors from leading Russian science universities emphasized that MES's main goal should be better integration of science and education, with PhD scientists (academicians) required to teach in both secondary and higher education institutions. Some presenters suggested that the Russian Academy of Sciences (RAS) and its institutions be transformed into academic universities, with academicians required to teach daily. Khlunov said the only way to awaken curiosity in hard science is to bring academicians and scientists back into the classroom to interact with young students. Panelists complained that Russian scientists have become overly focused on money, paying too much attention to getting awards and grants. Curiosity, not profit, should be the driving force behind scientific research and development, declared Khlunov.

14. (U) To develop an innovative economy and a national nanotechnology network, Khlunov argued that Russia must get rid of the artificial separation between science and education. Professors are needed to teach nanotechnologies and nanomaterials in order to bridge the gap between universities, research and development, and private business. Aleksandr Gorbatshevich, RAS corresponding member and Vice President of Saint Petersburg's Physico-Technological Research and Education Center (REC), proposed that Russia increase

MOSCOW 00002885 002.2 OF 003

mandatory school attendance from 11 to 12 years and establish science-focused secondary schools, including boarding schools, attached to leading research institutes and universities in Russia.

Needed: 100,000 - 150,000 Nano Specialists

15. (SBU) In his October 6 speech at the Forum's opening plenary session, President Medvedev called on MES to train 100,000-150,000 nanotechnology specialists that Russia needs now, but did not offer any specific proposals on how this could be done. Panel experts agreed that Russia's shortage of trained personnel remains a significant barrier to serious nanotechnology engagement. Khlunov called MES's October 7 announcement of its selection of 12 new national research universities an important step in creating a trained nanotechnology workforce for Russia's fledgling nanotechnology industry. (Note: A May 2008 presidential decree designated two prominent Moscow universities, National University of Science and Technology (MISIS) and Moscow Engineering and Physics Institute (MIFI) as national research universities. The now 14 national research universities will receive approximately \$6 million of federal funding over 5-10 years, as long as they raise additional private source funding. They are to train Ph.D. specialists, develop science research, and increase international high tech cooperation. In addition, President Medvedev signed a law on November 11 granting Moscow State University and St. Petersburg State University special status as unique scientific and educational centers. Their rectors will be appointed by either the President of Russia or other federal agencies and they can now develop and implement educational programs based on their own self-defined standards and requirements. End Note.)

16. (SBU) Khlunov commented that the scientific community has favorably received the initiative to create national research universities, which should generate greater opportunities for partnership and exchanges between Russian and foreign universities. MISIS Rector Dmitriy Livanov told the audience that he hired a U.S. professor to be the first foreign vice-rector at a Russian university to help spearhead MISIS's efforts to become a world-class research institution, akin to Massachusetts Institute of

Technology. (Note: The American Vice Rector of Academic Affairs told EST he was optimistic that MISIS' status as a national research university would help it to strengthen ties with the business community to secure GOR-mandated co-funding for high-tech research. He said that MISIS welcomed the law passed by the Federation Council on July 27 that allows universities and institutes to commercialize R&D results by establishing small innovative enterprises, because it provides a potential source of revenue. End Note.)

17. (SBU) Representatives of Russian universities on the panel, including Yevgeniy Chuprunov, Rector of Nizhniy Novgorod University, and Aleksey Khokhlov, Vice-Rector of Moscow State University, suggested that one way to realize President Medvedev's goal of creating a large nano workforce was to establish additional university-based educational and research and development centers specialized on nanotechnology. Certain Russian institutes of higher learning, including MISIS and St. Petersburg State University of Information Technologies, Mechanics and Optics (ITMO), have established centers to integrate education, R&D and business, but they are not dedicated to nanotechnology. After a presentation by scientists from Penn State's Center for Nanotechnology Education and Utilization, rectors Khokhlov and Chuprunov boasted that Moscow State University has a comparable Research and Education Nano-Center, and that Nizniy Novgorod University established the

MOSCOW 00002885 003.2 OF 003

first of its two nano centers in 1998. (Note: The university rectors did not say how many specialists these centers are training. End note.) Viktor Avdeyev, Deputy General Director of Composite Company, proposed creating an international education and engineering center to train specialists who are able to synthesize knowledge and manage nanotechnology projects. Panelists unanimously agreed with Khlunov's conclusion that in order to develop its nano-industry, Russia needs to adopt a more interdisciplinary approach to nano education, improve interaction between science and business, and expand inter-university and inter-institutional cooperation within Russia and with foreign universities and research centers. (Note: On October 22, Rusnano announced it will conduct open tenders in a new program to develop a network of up to 20 nanotechnology centers. It is planning to invest 19 billion rubles (approximately 640 million USD) in these centers in 2009 and 5.8 billion rubles (approximately 200 million USD) in 2010. In November, Rusnano issued a grant of 12 million rubles (approximately 415,000 USD) to St. Petersburg's Institute of Chemistry and Silicates to train nanotechnology specialists for St. Petersburg enterprises. End note.)

18. (SBU) Comment: In his November 12 state of the nation speech, President Medvedev reiterated his conviction that science and innovation can help Russia rid itself of its "humiliating raw materials dependence." There have been a spate of initiatives in recent months to improve science education and innovation. EST interlocutors agree that federal funding for the 14 new national research universities will help, but it is still unclear if universities will be able to raise matching funds from private sources and launch profitable innovative enterprises. In order to achieve its lofty goal of a 20 billion euro (approximately 30 billion US dollars) production volume for Russian nano-industry by 2015, the Russian government still has a long way to go to bridge the gap between science and education, expand research cooperation with foreign partners in international projects, create a system of national standards and regulations for the nano field, and commercialize findings. It will also have to address corruption and stop the flight of young Russian scientists to non-science positions in Russian business firms and overseas employment. Our Rusnano contacts could not tell us how Medvedev derived the number of 100,000-150,000 trained nano personnel that Russia supposedly needs. Although Rusnano and some universities have begun to develop specialized nano educational and innovative centers, they are unlikely to be able to churn out even close to this figure. But once they are "produced," new high-tech professionals are unlikely to stay in Russian science unless Rusnano and other innovative firms can create sufficiently high-paying positions with adequate laboratories for them to do so. End Comment.